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[57] 申請專利範圍：

1. 一種由一接收器與一記錄器組成之視頻與／或聲頻信號接收與記錄裝置，其中該記錄器具有：
  - 與該接收器一起接通之一中間儲存機構，此儲存機構具有有限於特定數據信號時段之容量，且在該特定時段中以循環方式永久儲存所接收之數據信號，及
  - 一接近與連接器，其具有讓使用者引動記錄器之功能，使得該記錄器可使用儲存於該中間儲存機構中之數據信號者。
2. 如申請專利範圍第1項所述之裝置，其中該接近與連接器於引動記錄器後將儲存於該中間儲存機構中之數據信號傳遞至該記錄器，且於一中間儲存後將繼而接收之數據信號儲存於該中間儲存機構者。
3. 如申請專利範圍第1項所述之裝置，其中該接近與連接器於引動記錄器後使該中間儲存機構停止，並將繼而接收之信號直接傳遞至該記錄器者。
4. 如申請專利範圍第1、2或3項所述之裝置，其中該中間儲存機構為一環形條狀數據載體或一儲存碟者。
5. 如申請專利範圍第1、2或3項所述之裝置，其中該中間儲存機構為一記憶體，其推動儲存之數據通過其間者。
6. 如申請專利範圍第1項所述之裝置，其中該有限容量相應於2至10分鐘，且最好為3.5至6.5分鐘之記錄時間者。
7. 如申請專利範圍第1、2或3項中任一項所述之裝置，其中當一記錄載體插入該記錄器中時，後者容許記錄載體前進並形成相應於該中間儲存機構之有限容量之一前置部份者。
8. 如申請專利範圍第1項所述之裝置，其中該接收器為一無線電接收器，且該記錄器為一卡式記錄器者。
9. 如申請專利範圍第1項所述之裝置，其中該接收器為一電視接收器，且該

記錄器爲一錄影機者。

- 10.如申請專利範圍第1項所述之裝置，  
其中該接收器爲一擴音器者。

- 11.如申請專利範圍第1項所述之裝置，  
其中該接收器／記錄器爲一攝影機者。

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Dr. Rolf E. Wilhelms

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A video and/or audio signal receiving and recording  
arrangement

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The invention relates to a video and/or audio signal receiving and recording arrangement comprising a receiver and a recording apparatus.

Such arrangements are known for example as video recorders with integrated playback device (monitor) or a separate television set. In another technical field, they are known as radio cassette recorders with an integrated radio receiver part.

Known from DE-OS 31 26 430 is a recording instrument, for example a dictating instrument, with an automatic starting device which switches on the dictating instrument and in particular the drive for the recording carrier when the amplitude of the signal to be recorded is above a response threshold. This construction avoids unnecessary tape use since the instrument works only when an effective signal is present.

With such a recording instrument, in order to avoid the commencement being recorded in a distorted fashion after the recording has started, since the recording instrument has as yet failed to reach the necessary running speed of the recording carrier, a delay part is provided which delays the recording of the signal on the

recording carrier by a period of time which corresponds to the time which the recording carrier needs to reach its desired speed.

It is possible furthermore to ascertain from the magazine Funkschau 1960, No. 22, pp. 559 to 561, in the case of a magnetic tape recorder with an automatic starting facility which only begins to run when there is a signal to be recorded, to delay the recording signal by a few seconds, for example by using an endless auxiliary tape, in order to lose as little signal as possible at the start.

It is known from US 4 232 602 in the case of live radio transmissions to delay the original signal by a certain period of time prior to transmission so that there is a possibility of monitoring the transmission and possibly of suppressing undesired passages without the receiver being aware of the fact.

Finally, radios or television sets are known in which, during transmission, the listener/viewer is able to replay a few seconds of the previously received transmission. Upon termination of this replay, the playback of the original transmission is resumed again at this point in time, in which case the part of the original transmission which continued to run during the replay is lost. A recording according to the invention is in this case neither intended nor possible.

Audio and/or video recordings of a live programme are usually made in that the receiver is switched on, the transmission channel or frequency which is of interest is located and the recording is commenced at a moment when the viewer or the listener passes the appropriate command to the recording instrument which is ready to make the recording. Furthermore, it is already known to pre-programme a recording, i.e. to record without the

listener or viewer directly experiencing the transmission.

With such recording instruments, it is deemed a drawback that when the listener or viewer receives a video and/or audio transmission and then, during the transmission, for example during a piece of music or during a part of a programme such as for example a news or information programme, decides that he wishes to record this transmission, can only make a recording from the time this decision is taken but not retroactively and therefore completely.

On the other hand, for technical and economic reasons it is not possible to take the precaution of recording all transmissions and then afterwards just keep a small part and erase the rest. That would require an excessive consumption of recording material, etc.

The problem on which the invention is based resides in providing a video and/or signal receiving and recording arrangement consisting of a receiver and a recording instrument with which it is possible in the event of an instant decision on the part of the user to record from an already running programme parts which had already been transmitted prior to the decision.

According to the invention, this problem is resolved by the embodiment indicated in patent claim 1.

In the case of the arrangement according to the invention, therefore, the data signal is stored temporarily for a certain time and is made available to the recording instrument when required so that if the user decides spontaneously to record a transmission, the data signal already transmitted during this period is still available. Therefore, if during this period of time, the user makes a decision to record a transmission, then this transmission can be recorded completely.

Particularly preferred developments and embodiments of the arrangement according to the invention are the object of patent claims 2 to 11.

The arrangement according to the invention comprises an interim data store, this term being understood to embrace any device or arrangement which stores an audio and/or video data in digital or analogue form for a limited period of time, preferably 2 to 10 minutes and in particular 3.5 to 6.5 minutes and then, in the same sequence as that in which the recording is made, records over and erases it, feeding the consequently freed storage space for transitionless storage of the subsequently arriving signals. Examples of such storage means are recording discs or recording tapes which run in a closed loop and which possibly have associated recording, erasing and playback stations. In the case of another form of memory used according to the invention, subsequently received data pushes previously stored data through the memory so that with this example of embodiment the stored data travel through the memory. An example of such a memory is the shift register.

In order to facilitate comprehension by the average man skilled in the art of audio and video recording equipment (video recorders) on the one hand and in the field of audio recording equipment (radio recorders) on the other, the manner in which the interim data storage means or the arrangement according to the invention functions will be described with reference to the following example:

The user of the radio recorder switches on his radio unit. This switching-on process simultaneously switches on the interim memory according to the invention. In the present case, let it be assumed that it has an audio tape of 5 minutes' duration. This audio

tape passes in a closed loop, possibly in the form of a Mobius tape to achieve the desired capacity and reduce the absolute length of the tape. In the area immediately in front of the recording heads are the erase heads; preferably, a recording head is used which records over and erases recorded tape so that in this case there is no need for an erase head.

By means of the circuit with which the man skilled in the art will be familiar, the intermediate storage means always records the transmission to which the user tunes the connected radio receiver part.

In the present example, it will always be just the last preceding 5 minutes which will be stored by the interim storage means. If, then, while the transmission is running, the user hears for instance a song of which he did not or could know that it would be included in the transmission but which he would nevertheless like to record, he switches on the recording cassette in the usual way and sets it to Record, so that immediately after the commencement of this recording, the interim storage means stops. In this way, for example, the last 5 minutes are contained in the interim storage means while the subsequent part of the transmission is recorded on the inserted cassette.

The period of 5 minutes was chosen in this example because experience shows that, if a receiver is not already prepared for recording, then this is sufficient time to find a tape, insert it into the recording instrument and commence the recording. In the case of normal songs which last about 3 minutes, it would be a good idea when required only to start the inserted cassette after the song is finished in order to save on the subsequent splicing together of the two parts of the song. Having regard to the frequent song length of about



3 minutes, a storage means having the (time) storage capacity of about 3.5 minutes is required.

Preferably, the recording device is so constructed that when the tape is inserted, the tape is advanced automatically by exactly the running time which corresponds to the recording capacity of the interim storage means so that an unrecorded "leader" is formed. Then, subsequently, it is simple for the contents of the (stopped or switched off) interim storage means to be transferred to the correct location, the "leader", of the inserted tape.

In the case of the particularly preferred embodiment, when the recording is switched on, the contents of the interim storage means are transferred to the inserted tape directly and in the present case with a time offset of 5 minutes, to the conventional cassette tape.

In the manner described, it is possible to make recordings on per se conventional recording carriers (e.g. conventional recording cassettes for radio or video recorders) which were received prior to the start of the usual recording, in the present case during the 5 minute time lapse prior to the start. It will be readily appreciated that there will in the end be contained on the conventional recording carrier a part of a recording which was received before the recording with the conventional recording carrier was started.

According to the invention, it is possible substantially to achieve the following three main versions of the arrangement according to the invention, the constructional realisations being within the scope of the relevant average persons skilled in the art and without any inventive contribution:

Version 1:

1. By switching on the receiving unit, the interim storage memory is switched on to the channel or frequency to which the receiver is tuned.
2. By inserting the recording carrier (tape, record or the like) and starting the recording and/or (if the recording carrier is already inserted) upon the start of the recording, recording in the interim storage means is stopped and if required a brief time lag is so actuated that the recording in the interim storage means is stopped only briefly after commencement of the recording.
3. When the recording is switched off, the recording in the interim storage means remains stopped (if required, provision can be made whereby a separate command activates the interim storage means again and then, if the stored contents of the interim storage means have still not been transferred to the recording carrier, then the said contents will be lost).
4. With a separate command, the stored contents of the stopped interim storage means is subsequently transferred to the recording carrier provided and if necessary (spliced together with) the subsequent part of the transmission which is recorded on the conventional carrier.
5. Switching off the receiver cancels out the locking device on the interim storage means.
6. By switching on the receiver, the interim storage means is switched on at the frequency or on the channel to which the receiver has been set.

Version II:

1. By switching on the receiving unit, the interim storage memory is switched on to the channel or frequency to which the receiver is tuned.

2. The "leader" described is either formed in that when the recording carrier is inserted and/or when the recording is started, the recording carrier is advanced by the capacity of the interim storage means, the resultant unrecorded "leader" corresponding in time to the stored contents of the interim storage means.

If the leader is formed when the recording carrier is inserted, then this part of Version II corresponds to step 2 in Version I.

If the leader is only formed by the "Record" signal, then the recording on the interim storage means is only terminated upon completion of tape advance and commencement of recording.

3. When the recording is switched off, also transfer to the interim storage means is stopped (for the rest, see 3, Version I).

4. Transfer of the stored contents of the stopped interim storage means to the "leader" of the recording carrier. To this end, it is possible to provide that upon switch-off of transfer to the interim storage means this latter stores a signal which so co-operates with a corresponding signal on the conventional recording carrier which is generated on this latter at the commencement of recording, that the contents of the

interim storage means can be transferred and combined virtually "seamlessly" to/with the recording on(to) the conventional recording carrier, namely onto the "leader" at some later time.

5. Switching off the receiver cuts out the locking device for transfer to the interim storage means.

6. Switching on the receiver commences (switches on) transfer to the interim storage means on the frequency or channel to which the receiver has been set.

#### Version III.

1. Switching on the receiver switches the interim storage means on to the frequency or channel to which the receiver has been set.

2. By inserting the recording carrier and starting the recording or (if the the recording carrier is already inserted) starting the recording, the transfer via a permanent interim storage means to the recording carrier is triggered, the signals recorded on the recording carrier being delayed by the time corresponding to the storage capacity. Permanent interim storage means is a term to be understood that the storage means in this version is not switched off, transfer of the transmission to the recording carrier via the permanent interim storage means taking place continuously but delayed corresponding to the interim storage's capacity. With this version, the described interim storage means is preferred in which the stored signals travel through the storage means (e.g. shift register).

3. In actual fact, switching off the recording has the effect of switching off the transfer via the permanent interim storage means to the recording carrier, the recording carrier stopping while the interim storage means continues to run, however. The command to switch off the recording can possibly be processed after a time lag corresponding to the interim storage's capacity in order to compensate for the delay due to the delayed transfer from the interim storage means to the recording carrier and to transfer still completely to the recording carrier the contents of the interim storage means from the point in time at which the command to switch off the recording was given.
4. Later transfer of the contents of the interim storage means to the actual recording carrier is unnecessary.
5. Switching off the receiver switches off the interim storage means at the same time, possibly with the delay described under 3 above to ensure complete recording of the contents of the interim storage means at the point in time of switching off the receiver onto the recording carrier.
6. Switching on the receiver switches on the interim storage means to the frequency or channel to which the receiver is set.

Version I is the simplest, Version II is a preferred and Version III is the most preferred of the examples of the embodiment described here by way of example.

In the case of another simple embodiment of the apparatus according to the invention, the interim storage means may be a separate component unit which is connected in parallel with the recorder in the arrangement according to the invention which consists of a receiver and a recorder. In this respect, as the actual interim storage

means, as described, it comprises for example an annular tape, an endless tape, a storage disc or some other storage means which is suitable according to the invention, and also a receiving station, a playback station and an erase station, possibly also in combination with one another. With regard to circuitry, it can according to Versions I to III be coupled to per se known combinations consisting of recording and receiving apparatus.

Preferred however are the stations provided on per se known equipment. Thus, for instance, in the case of double cassette decks, also the stations of the cassette deck which is not provided for direct recording are suitable.

Even though the arrangement according to the invention is preferably described with reference to a radio cassette recorder, the teaching according to the invention is also valid for a man skilled in the field of video recorders so that it is made possible here by the same principle according to the invention, during a television transmission, to keep in store that which has just been shown, on a conventional video cassette, although the cassette for the recording may still not have been inserted and/or started.

The teaching according to the invention is interesting also for audio tape recorders and video cameras in which recordings have to be made of events where it is not exactly determined when they will start. The recording instruments or video cameras which are provided with the interim storage means according to the invention can be held ready for recording without the actual recording being made and can then be switched on by command of the user after the event has started. The commencement of the event is then, according to the version I and II, to be

found in the interim storage means which was stopped after the commencement of the actual recording or, according to Version III, it may be retroactively transferred to the recording carrier. This solution may lead to thoroughly fascinating results not only in the case of natural science recordings but also in connection with sport or news reports. It does also considerably reduce the consumption of recording tapes.

The teaching according to the invention can be applied in various ways by the average man skilled in the art: in a preferred embodiment, the interim storage means according to the invention can, in order to resolve the problem on which the invention is based, be integrated into the recording instrument or into the receiving instrument so that it becomes possible to obtain commercially for example such a radio recorder, such a video recorder, such a television receiver, such a tape recorder or such a video camera. It is however also conceivable that the described interim storage means, adapted to the task and the solution according to the invention, may be constructed as a separate component either as a module or as a separate device. Accordingly, the protection of the patent to be granted should extend also to these embodiments of the invention.

# Patent claims

1. A video and/or audio signal receiving and recording arrangement consisting of a receiver and a recording instrument with

an interim data storage means, switched on together with the receiver, and which has a capacity limited according to a specific period of data signal and which stores the received data signals permanently cyclically for the specified period and

an access and connecting device which as a function of the actuation of the recorder by the user makes available to the recorder the data signals stored in the interim storage means.

2. An arrangement according to claim 1, characterised in that the access and connecting device, after actuation of the recorder, transfers to the recorder the data signals stored in the interim storage means as well as the data signals subsequently received after an intermediate storage in the interim data store.

3. An arrangement according to claim 1, characterised in that the access and connecting device, after actuation of the recorder, stops the interim data store and transfers the subsequently received data signals directly to the recorder.

4. An arrangement according to one of the preceding claims, characterised in that the interim data



storage means is an annular strip-like data carrier or a storage disc.

5. An arrangement according to one of the preceding claims, characterised in that the interim data storage means is a memory which pushes through the data stored.

6. An arrangement according to one of the preceding claims, characterised in that the limited capacity corresponds to a recording time of 2 to 10 and preferably 3.5 to 6.5 minutes.

7. An arrangement according to one of claims 3 to 6, characterised in that when a recording carrier is inserted into the recorder, this latter allows the recording carrier to advance and form a leader which corresponds to the limited capacity of the interim data storage means.

8. An arrangement according to one of the preceding claims, characterised in that the receiver is a radio receiver and the recorder is a cassette recorder.

9. An arrangement according to one of claims 1 to 7, characterised in that the receiver is a television receiver and the recorder is a video recorder.

10. An arrangement according to one of claims 1 to 7, characterised in that the receiver is a microphone and the recorder is a tape recorder.

11. An arrangement according to one of claims 1 to 7, characterised in that the receiver/recorder is a video camera.

### Abstract

A device or arrangement for recording video and/or audio data with at least one receiving and recording device and a connected or integrated additional audio and/or video data storage means of limited capacity, of 2 to 10 minutes, preferably 3.5 to 6.5 minutes which, when the receiving device is set in operation, commences storage of the data received and stores it in the same sequence as reception and for the storage period corresponding to the limited storage capacity and then in the sequence in which it is stored erases it or disposes of it and accordingly fills up the storage space with the continuously received data and upon commencement of the per se known storage on per se known storage material (recording tape cassettes, video cassettes) either stops or continuously transfers the received data for recording purposes, with a time lag corresponding to the limited capacity of the interim storage means, to the per se known recording carrier.